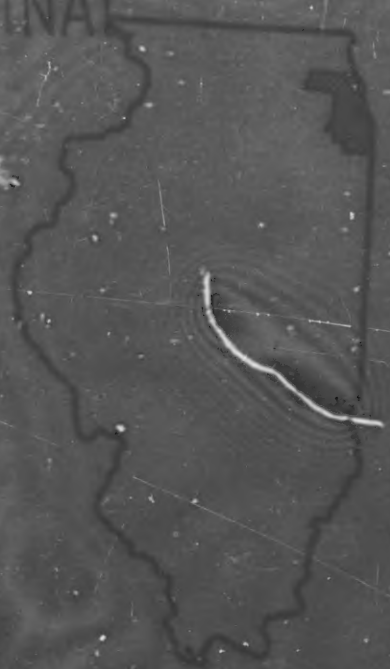
FEMA 760170380/9856

FLOOD INSURANCE STUDY

COMPLETED

ORIGINAL

VILLAGE OF FOREST WOOD, ILLINOIS
COOK COUNTY



REVISED:

AUGUST 5, 1986

Federal Emergency Management Agency

COMMUNITY NUMBER 170170

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NOTICE TO
FLOOD INSURANCE STUDY USERS

Individual components of this Flood Insurance Study (i.e., text, tables, profiles, and maps) are all subject to revision as additional data become available. Because revised components may be issued separately, study users should consult the community map repository for those components that are currently effective.

In cases where this Flood Insurance Study and any components thereof warrant revision, a Revisions Description section may be incorporated into this text. When applicable, study users should refer to the Revisions Description to obtain pertinent data and information concerning revisions.

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Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

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FLOOD INSURANCE STUDY

VILLAGE OF CRESTWOOD,
COOK COUNTY, ILLINOIS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Village of Crestwood, Cook County, Illinois, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert the Village of Crestwood to the regular program of flood insurance by the Federal Insurance Administration (FIA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these Federally-supported studies are based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.1 (d). In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Harris-Toups Associates for the Federal Insurance Administration, under Contract No. H-4564. This study was completed in April 1979.

1.3 Coordination

A coordination meeting was held during May 1977, with the FIA Consultation Coordination Officer, village officials, representatives of the Illinois Department of Transportation, Division of Water Resources (DOWR), and Harris-Toups Associates. During this meeting, the Flood Insurance Program, Flood Insurance Study Guidelines, and the scope of this study were reviewed.

Effective coordination efforts were established with the community, the Illinois Division of Water Resources, the U.S. Department of Agriculture, Soil Conservation Service (SCS), the Metropolitan Sanitary District of Greater Chicago, and several private consultants in order to locate all

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appropriate hydrologic and hydraulic data. In addition, several meetings were held throughout the study period with representatives of those agencies listed above for the purposes of data collection and relaying and reviewing materials regarding flood elevations, flood boundaries, and floodway delineations.

One such meeting was held on August 2, 1978, with representatives of the DOWR, the FIA, the Metropolitan Sanitary District of Greater Chicago, and the SCS. The objective of this meeting was to review and reconcile differences of the 100-year frequency discharges presented in a previous report prepared by the SCS, in cooperation with the Metropolitan Sanitary District of Greater Chicago. It was generally agreed at this meeting that the discharges previously prepared in the unpublished Flood Insurance Study for unincorporated Cook County, would be used for Tinley Creek. The discharges for the remaining flooding sources as developed by the Study Contractor reflected the existing conditions in the affected watersheds for purposes of this Flood Insurance Study.

On December 19, 1978, the preliminary results of the work done by the Study Contractor were presented and reviewed at an intermediate coordination meeting attended by personnel of the Village of Crestwood, the Illinois Division of Water Resources, and the Study Contractor.

The purpose of this meeting was a technical review of the data developed, including flood boundaries, floodways, and flood profiles. It was generally agreed that these were correctly determined and approximately delineated by the Study Contractor.

Another coordination meeting was held on March 2, 1979 with representatives of the FIA, the DOWR, the Metropolitan Sanitary District of Greater Chicago, the SCS, the Cook County Flood Insurance Study Contractor, and Harris-Toups Associates. This meeting was the result of the difference in profiles between this study, the Cook County Flood Insurance Study and the SCS Study.

Due to these discrepancies it was felt by all those in attendance that a new study of Tinley Creek from the confluence of the Calumet Sag Canal to 151st Street was necessary. Due to the work being done on Tinley Creek by Harris-Toups Associates for Crestwood and Orland Park which are at each end of the proposed Tinley Creek Study, Harris-Toups Associates was requested by the FIA to submit a proposal to perform the Tinley Creek Study.

Later, it was decided by the FIA that Tinley Creek did not warrant extra studies since most of the area included in the proposed study was located in forest preserves which are not included in the Cook County Study. It was therefore concluded by the FIA that the work done by Harris-Toups Associates was the best available data and should be used for the study of Crestwood.

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On September 6, 1979, the results of the work by the Study Contractor were reviewed and accepted at a final coordination meeting attended by personnel of Harris-Toups Associates, the FIA, the DOWR, and the Village of Crestwood.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Crestwood. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected with priority given to all known flood hazard areas, and areas of projected development or proposed construction for the next five years, through June 1982. The scope and methods of study were proposed to and agreed upon by the FIA and the Village of Crestwood.

The flooding sources studied by detailed methods are listed below:

a. Tinley Creek, within the corporate limits;

b. Crestwood Drainage Ditch West, from the Calumet Sag Channel to 750 feet upstream from 135th Avenue; and

c. Crestwood Drainage Ditch East, from Cicero Avenue to Keeler Avenue.

2.2 Community Description

The Village of Crestwood is located in northeastern Illinois, in southern Cook County, about two miles south of the City of Chicago. Crestwood is bordered by the Village of Alsip on the north, and Tobbins and Midlothian to the east. The remaining borders are shared with Cook County Forest Preserves and unincorporated Cook County. The village covers an area of approximately 2.72 square miles. The population of the Village of Crestwood was 6,092 in 1970. Growth projections show that Crestwood will have a population of 11,400 in 1980, and an ultimate population of 16,000 is projected for the year 2010 (Reference 1).

The climate in Crestwood is classified as humid continental. Cold winters, warm summers and relatively large daily, monthly, and yearly variations in both temperature and precipitation are characteristic of the climate. The average annual precipitation is 33 inches and the average annual unmelted snowfall is 32 inches. The mean annual temperature is 49 degrees Fahrenheit (F.), while the mean monthly temperature range is from 23 degrees F. in January, to 72 degrees F. in July (Reference 2).

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FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF CRESTWOOD, IL

(COOK CO.)

VICINITY MAP

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Crestwood is located in the valley created by the Calumet Slough which is now the Calumet Sag Channel. The area is characterized by a very flat topography common to river flood plains. Elevations in Crestwood range from 635 to 590 feet.

Soils found in the Village of Crestwood consist of the Nappanee-Montgomery Association, the Maumee-Watseka-Montgomery Association, and the Montgomery-Miford-Martinton Association. The Nappanee-Montgomery Association consists of deep, somewhat poorly drained and poorly drained, slowly permeable soils that are formed in silty clay till or lakebed sediments. The Maumee-Watseka-Montgomery Association are very poorly drained to somewhat poorly drained, nearly level and depressional soils that are formed in course textured to fine textured lake sediments. The Montgomery-Milford-Martinton Association is deep, poorly drained and somwhat poorly drained, nearly level soils that are formed in deposits of silt and clay (Reference 3).

The village consists of residential, commercial, and industrial areas. Approximately 70 percent of Crestwood is residential. The major industrial concentration is located along the Calumet Sag Road and commercial areas are found along Cicero Avenue. There is about 10 percent of Crestwood which is still undeveloped. The flood plain for Tinley Creek is predominantly parks and open space with some residential development; the flood plain for Crestwood Drainage West is in residential use; and the flood plain for Crestwood Drainage East is commercially developed and undeveloped in the downstream portion, and is residentially developed in the upstream portion.

2.3 Principal Flood Problems

There are two principal flooding sources in Crestwood, Tinley Creek and Crestwood Drainage Ditch. Tinley Creek is one of the largest streams in the area; and under unobstructed flooding conditions, it will stay within the stream banks. However, the slightest obstruction at the Central Avenue or the State Route 83 bridges could raise water levels significantly and cause considerable overbank flooding. The flood of record for Tinley Creek in Crestwood occurred in October 1954. During this flood there was considerable flooding upstream of Central Avenue. Other major floods on Tinley Creek occurred in July 1957, and April 1960.

Crestwood Drainage Ditch consists of three branches, two of which have an affect on Crestwood. The west branch is an improved channel constructed by the State of Illinois. The channel is adequate to carry the 100-year discharge without causing damaging flood levels.

The east branch of Crestwood Drainage Ditch does have a flooding problem. The problem is due mainly to inadequate channel capacity. Overbank flooding was experienced during the flood of record of April 1947, along the entire length of Crestwood Drainage Ditch East.

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2.4 Flood Protection Measures

The Village of Crestwood has been the recipient of various measures of protection against flooding. Included in these means of protection are channel improvements on Crestwood Drainage Ditch West, the enclosure of the central channel of Crestwood Drainage Ditch, and channelization in the upper Crestwood Drainage Ditch East watershed. The village has also been active in the Calumet Sag Watershed Steering committee which is a committee of the concerned communities whose purpose is to help coordinate flood control activities within the Calumet Sag watershed.

The Village of Crestwood will also benefit from planned diversion conduits presently under contract by the Cook County Highway Department which will divert floodwaters from Midlothian Creek and Natalie Creek in the Village of Midlothian, to the Calumet Sag Channel. The effect of these structures is incorporated in the analysis conducted for this report. Without these structures major floods would flow overland through eastern Crestwood.

The DOWR has plans to implement Tinley Creek in Crestwood in their flood plain regulation program in the near future. Presently, the regulations governing flood plains in the Village of Crestwood consist of an ordinance required by the Metropolitan Sanitary District of Greater Chicago which is comprised of the general provisions of the Illinois guidelines for regulating flood plains. The Illinois State Statutes require permits from the DOWR for any construction in waterways within the State of Illinois.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one percent chance of annual occurrence) in any 50-year period is about 40 percent (four in ten), and for any 90-year period, the risk increases to about 60 percent (six in ten). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

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3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

To determine discharge-frequency data for the 100-year and the 2-year storms on the Crestwood Drainage Ditch, the Illinois State Water Survey's State Standard method was used (Reference 4). The peak discharges were adjusted to the Tinley Creek gaging station near Palos Park, Illinois, (No. 05536500) using the method outlined in the report by the U.S. Geological Survey (USGS), Techniques for Estimating Magnitude and Frequency of Floods Illinois (Reference 5).

The hydrologic parameters used in this method include drainage area, topography, percentage of watershed urbanization, and regional rainfall and rainfall runoff characteristics. Peak discharges for the 10-, and 50-year floods were interpolated between the 2-year and 100-year discharges on a log-Pearson Type III distribution. The discharge for the 500-year flood was extrapolated from the log-Pearson data (Reference 5).

Previously certified 100-year discharges for Tinley Creek were used in the analysis for Tinley Creek. The 10-, 50-, and 500-year discharges from the Cook County study (Reference 6) were found to be accurate and consistant with the discharges determined by the Study Contractor and were used in this report.

The discharges presented here have been reviewed by the Village of Crestwood, the Metropolitan Sanitary District of Greater Chicago, and the SCS. The discharges have been reviewed and certified by the DOWR.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 1.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the streams in the community were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each flooding source studied in detail.

Cross sections in all detailed studies were located at close intervals above and below bridges and culverts in order to compute the significant backwater effects of these structures. All bridges and culverts were field surveyed to obtain elevation data and structural geometry. Limited cross section data was obtained from the SCS. This data was field checked for accuracy and adjusted in areas where there had been substantial cross section changes due to recent development. Additional cross section data were obtained by field surveys undertaken by the Study Contractor.

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TABLE 1 - SUMMARY OF DISCHARGES (REVISED: October 16, 1984)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CRESTWOOD DRAINAGE DITCH WEST					
At Route 83	1.08	242	343	384	500
TINLEY CREEK					
At 131st Street	13.53	870	1,350	1,550	2,100
At the Calumet Sag Confluence	14.05	923	1,425	1,635	2,222

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Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles. For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map.

The roughness coefficients (Mannings "n"), used in the computations in the WSP-2 computer program were based on field investigations of the flood plain areas and previous studies conducted by the SCS (Reference 7). Roughness coefficients for Tinley Creek ranged from 0.030 to 0.045 in the channel, and 0.050 to 0.140 in the overbank; for Crestwood Drainage Ditch East values ranged from 0.030 to 0.035 in the channel and from 0.070 to 0.080 in the overbank; and for Crestwood Drainage Ditch West values ranged from 0.030 to 0.045 in the channel, and from 0.050 to 0.078 in the overbank.

Water-surface elevations of floods of the selected recurrence intervals were computed through the use of the SCS WSP-2 step-backwater computer program for Tinley Creek, Crestwood Drainage Ditch West, and Crestwood Drainage Ditch East (Reference 8). For all three streams studied by detail methods starting water-surface elevations for floods of selected recurrence intervals were determined by the slope area method. Flood profiles were drawn showing computed water surface elevations for floods of selected recurrence intervals.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during this study.

All elevations are referenced from National Geodetic Vertical Datum of 1929 (NGVD); elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year floods have been delineated using the elevations determined at each cross section;

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between cross sections the boundaries were interpolated using topographic maps at a scale of 1:4800, with a contour interval of two feet (Reference 9). All boundaries were established in conjunction with field investigations conducted by hydraulic engineers. One hundred year frequency flood boundaries for approximate studies (flooding associated with the Calumet Sag Channel) were determined by utilizing existing topographic mapping and the Hydraulic Investigation Maps published by the USGS in cooperation with the Northeastern Illinois Planning Commission (References 9, 10, and 11).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map. Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to lack of detailed topographical information or to limitations of the map scale, such areas are not shown. In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. In Illinois though, under Revised Statutes, Section 65f, Chapter 19 as amended 1973 (Reference 12), encroachment in the flood plain is limited to that which will cause only an insignificant increase in flood heights. Thus, at the recommendation of the Illinois DOWR, a floodway having no more than a 0.1-foot surcharge has been delineated for this study (Reference 4).

These floodways were developed by evaluating the equal conveyance reduction from each side of the flood plain. These were negotiated and coordinated with the local, state, and regional agencies. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway was established (Table 2). Portions of the Crestwood Drainage west floodway extend beyond the corporate limits.

As shown on the Flood Boundary and Floodway Map, the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE (FEET)
TINLEY CREEK							
A	550	52	222	7.98	594.8	594.7	0.1
B	730	52	281	6.29	596.9	596.8	0.1
C	880	55	298	5.94	597.9	597.8	0.1
D	1130	59	317	5.58	599.3	599.2	0.1
E	1600	193	391	4.53	601.7	601.6	0.1
F	2850	60	477	4.78	605.5	605.4	0.1
G	3230	80	512	4.45	606.7	606.6	0.1
H	4240	243	1384	2.30	608.8	608.7	0.1
I	4440	199	906	3.52	609.8	609.7	0.1

[1]FEET ABOVE MOUTH

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TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF CRESTWOOD, IL

(COOK CO.)

FLOODWAY DATA

TINLEY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
CRESTWOOD DRAINAGE DITCH WEST							
A	280	45	124	10.1	591.7	591.7	0.0
B	510	38	185	2.1	593.7	593.6	0.1
C	710	41	174	2.2	593.8	593.7	0.1
D	1010	35	152	2.5	593.9	593.8	0.1
E	1310	40	139	2.8	593.9	593.9	0.0
F	1630	83[2]	96	4.0	595.8	595.7	0.1
G	2010	42[2]	113	3.4	596.2	596.1	0.1
H	2410	32[2]	70	5.5	597.1	597.1	0.0
I	2710	33[2]	62	6.2	598.4	598.4	0.0
J	3110	37[2]	60	6.4	600.5	600.5	0.0
K	3510	46	56	6.8	602.7	602.7	0.0
L	3910	58	57	6.8	604.9	604.9	0.0
M	4210	39	73	5.3	606.1	606.1	0.0
N	4440	52	71	5.4	606.8	606.8	0.0
O	4510	85	230	1.7	607.2	607.2	0.0
P	5080	40	51	7.5	614.2	614.2	0.0

[1]FEET ABOVE MOUTH
[2]THIS WIDTH EXTENDS BEYOND CORPORATE LIMITS

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF CRESTWOOD, IL
(COOK CO.)

FLOODWAY DATA

CRESTWOOD DRAINAGE DITCH WEST

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The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 0.1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

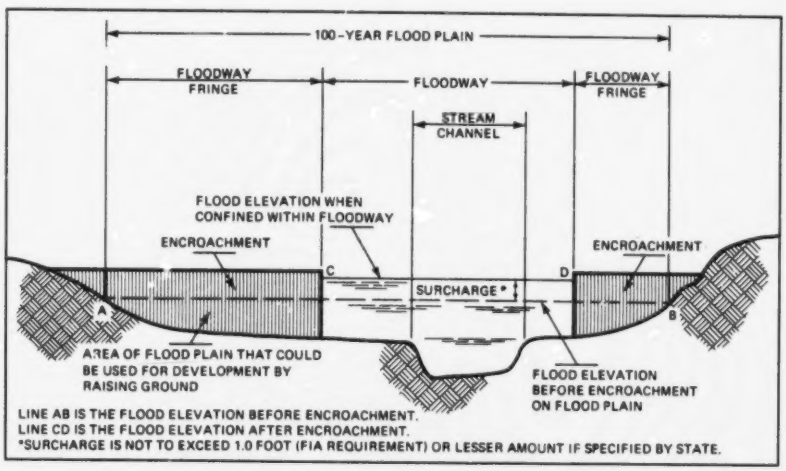
100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT.
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT.
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FIGURE 2 - Floodway Schematic

The floodways in this report are recommended to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHF), and flood insurance zone designations for each flooding source affecting the Village of Crestwood.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

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The locations of the reaches determined for the Village of Crestwood are shown on the Flood Profiles and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Village of Crestwood were divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations are shown or FHFs determined.
Zones A1, A2, A5:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations are shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

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Zone C: Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Village of Crestwood is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

The Robbins Flood Insurance Study (Reference 13) disagreed with this study in regard to flood boundaries and designations. Some Zone B flooding from the Crestwood Drainage Ditch East does not appear in the Robbins Flood Insurance Study. This is because the Crestwood Drainage Ditch East was not considered in the preparation of the Robbins Flood Insurance Study. The Flood Insurance Study for the Village of Midlothian agrees with this study (Reference 14). The Cook County Flood Insurance Study (Reference 6) differed from this study in regard to flooding delineation, zones, and corporate limits due to more recent information acquired for this study. There are no common flooding sources in the Village of Alsip Flood Insurance Study (Reference 15).

The SCS, in cooperation with the Metropolitan Sanitary District of Greater Chicago, has published a report "Calumet Sag Watershed, Flood Plain Information Map and Profiles" (Reference 8). Flood boundaries, flood profiles, floodways, and 100-year discharge values presented in this study are significantly different from those presented in the SCS study. These differences relate to the scope of work of the different reports, the future conditions assumptions made in the SCS report, and the limited number of cross sections used in the SCS report. These differences have been coordinated with the SCS, the Metropolitan Sanitary District of Greater Chicago, the DOWR, and the FIA.

The USGS, in cooperation with the Northeastern Illinois Planning Commission has published Hydrologic Investigation Maps for several USGS Quadrangles (References 10 and 11). These publications delineate the boundaries of the floods of record of major waterways throughout northeastern Illinois on 7.5 Minute Topographic Maps. Crestwood is located on the Blue Island and Palos Park Quadrangles (References 16 and 17). The boundaries presented in this Flood Insurance Study reflect on-going improvements including the Cook County Highway Department's Midlothian Creek Diversion Project and will supersede the flood of record boundaries for purposes of Flood Insurance and planning.

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
TINLEY CREEK							
REACH 1	0001	−1.5	−0.5	0.5	015	A3	VARIES-SEE MAP
CRESTWOOD DRAINAGE DITCH WEST							
REACH 1	0001	−1.0	−0.2	0.6	010	A2	VARIES-SEE MAP
REACH 2	0001	−1.0	−0.2	0.6	010	A2	VARIES-SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF CRESTWOOD, IL

(COOK CO.)

FLOOD INSURANCE ZONE DATA

TINLEY CREEK — CRESTWOOD DRAINAGE DITCH WEST

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A Flood Hazard Boundary Map has been published by the Federal Insurance Administration (Reference 18). The differences between the Flood Hazard Boundary Map and this study are justified due to the more detailed nature of this Flood Insurance Study.

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the National Flood Insurance Program.

7.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, Federal Emergency Management Agency, 300 South Wacker Drive, Chicago, Illinois 60606.

8.0 REFERENCES AND BIBLIOGRAPHY

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9.0 REVISIONS DESCRIPTION (Revised: October 16, 1984)

9.1 Purpose

The purpose of this Flood Insurance Study Revisions Description is to incorporate new or revised data into this currently effective Flood Insurance Study for the Village of Crestwood, Cook County, Illinois. This Revisions Description is intended to provide updated information which aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

9.2 Acknowledgments

The hydraulic analyses for this Revisions Description were performed by the Illinois Department of Transportation, Division of Water Resources (DOWR), and Edmund M. Burke & Associates, LTD. The Federal Emergency Management Agency (FEMA) reviewed and accepted this data as valid for purposes of this revision.

9.3 Scope

The restudy of Tinley Creek includes the entire reach affecting the community between 127th Street and 131st Street. This stream reach was revised to include new bridge information.

The restudy of Crestwood Drainage Ditch East includes the entire reach affecting the community between Cicero Avenue and Kostner Avenue. This stream reach was revised to include realignment and rechannelization information.

9.4 Hydrologic and Hydraulic Analyses

The restudy of Tinley Creek was undertaken to revise the U.S. Department of Agriculture, Soil Conservation Service (SCS), WSP-2 step-backwater computer program (Reference 8) to include new data generated from the reconstruction of the State Route 83 bridge and weir drop structures. The bridge reconstruction increased its cross-sectional area and the weir reconstruction improved the flow characteristics for Tinley Creek outfall into Calumet Sag Channel. New bridge cross-section data and new starting water-surface elevations computed by the DOWR were incorporated into the original computer program. Roughness coefficients and peak discharges from the initial analysis were still considered valid and were not changed for this reanalysis.

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The restudy of Crestwood Drainage Ditch East was undertaken to reflect the increased flow capacity of the channel as a result of dredging and realignment. In addition, overland flow reaching the drain has been reduced due to the installation of barriers and interceptor drains in the drainage area. These barriers include mound areas constructed along 143rd Street, Kostner Avenue, and Interstate 294. Drainage was improved by the installation of major storm sewers along Cicero Avenue, 143rd Street, and Crawford Avenue. Since less overland flow reaches the ditch, the peak flows from the 10-, 50-, 100-, and 500-year floods are contained within the channel. Hence, Crestwood Drainage Ditch East is no longer considered a major flooding source in Crestwood.

The base flood elevations, flood insurance zone designations, and regulatory floodway for Tinley Creek have been revised as described in this Addendum to the original Flood Insurance Study, and are shown on the revised Flood Insurance Rate Map and Flood Boundary and Floodway Map. Flood boundaries were revised using 2-foot contour maps from the Flood Plain Information Maps for the Calumet-Sag Watershed (Reference 9).

All flood information for Crestwood Drainage Ditch East has been deleted from the original Flood Insurance Study, and the area is now shown on the revised Flood Insurance Rate Map and Flood Boundary and Floodway Map as an area of minimal flooding.

This revised information supersedes those portions of the original Flood Insurance Study for the Village of Crestwood, Cook County, Illinois.

9.5 Floodways

Floodway computations for Tinley Creek were revised as a result of the new hydraulic computations.

The revised floodway was computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for each segment for which a floodway was computed and are presented in Table 2, Floodway Data.

9.6 Other Studies

The studies of those communities bordering the Village of Crestwood that are affected by the Tinley Creek reanalysis include Cook County and the Village of Alsip Flood Insurance Studies (References 6 and 15). The Cook County Flood Insurance Study differed from this study regarding the flood delineations and zone designations for the stream reach that extends from 700 to 1,000 feet downstream of Central Avenue. Hence, flooding was delineated in this study to reflect flooding which is not shown in the currently effective Cook County Flood Insurance Study. The Flood Insurance Study for the Village of Alsip agrees with the special flood hazard areas designated in this study.

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REVISIONS DESCRIPTION (Revised: August 5, 1986)

9.1.1 Purpose

The purpose of this Flood Insurance Study Revisions Description is to incorporate revised data into this currently effective Flood Insurance Study for the Village of Crestwood, Cook County, Illinois. This Revisions Description is intended to provide updated information that aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

9.2.1 Acknowledgments

The hydrologic and hydraulic analyses for this Revisions Description were performed by the U.S. Department of Agriculture, Soil Conservation Service (SCS) in cooperation with the Illinois Department of Transportation, Division of Water Resources (DOWR). The Federal Emergency Management Agency (FEMA) reviewed and accepted these data for purposes of this revision.

9.3.1 Scope

The entire length of Tinley Creek within the Village of Crestwood was revised. This includes the stream reach between 127th Street and 131st Street.

The restudy upon which these revisions are based was published in "Floodplain Management Study, Lower Tinley Creek, Cook County, Illinois," dated September 1984 (Reference 1). The new study was considered necessary because of concerns expressed by the SCS and the DOWR that increased development in the watershed has increased the floodprone areas within the community. The flood plain management study identifies existing hazards and proposes alternative solutions for flood control measures.

9.4.1 Hydrologic and Hydraulic Analyses

Hydrologic analyses were performed using the SCS hydrology program Technical Release No. 20 (Reference 2). The model developed for this study was based on land use in 1982 and calibrated to match the U.S. Geological Survey gage records from their gage at 135th Street. It also approximated gage records and associated high-water marks for the floods of June 1981 and December 1982. A future condition model for the year 1995 was assembled by modifying runoff curve numbers and times of concentration to reflect increased urban development. Peak discharges increased due to a change in timing of peaks rather than a large increase in runoff volume. Peak discharges are summarized in Table 4, Summary of Discharges.

Hydraulic analyses were performed using the SCS Hydraulic Model WSP-2 (Reference 3). Roughness coefficients from the initial analysis were still considered valid and were not changed for this reanalysis. Peak discharges were input in the hydraulic model at appropriate locations. Overflow from Tinley Creek was identified as shallow flooding for areas west of Central Avenue north toward 127th Street and east of West Playfield Drive east toward Playfield Drive. The hydraulic analyses for these areas were characterized by streets modeled as channels and ponding areas modeled as

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TABLE 4 - SUMMARY OF DISCHARGES (REVISED: August 5, 1986)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CRESTWOOD DRAINAGE DITCH WEST					
at Route 83	1.08	242	343	384	500
TINLEY CREEK					
at 131st Street	12.5	1,600	2,620	3,080	4,180
at the Calumet Sag Confluence	12.8	1,368	1,665	1,770	2,005

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reservoirs. Base flood elevations for these areas were identified in the SCS flood plain management study for Tinley Creek as matching flood elevations for floods of June 1981 and December 1982.

The base flood elevations, Flood Insurance Zone Designations, and regulatory floodway for Tinley Creek have been revised as described in this Revisions Description to the original Flood Insurance Study, and are shown on the revised Flood Insurance Rate Map and Flood Boundary and Floodway Map. Flood boundaries were revised using 2-foot contour maps from the flood plain maps prepared by the DOWR included in the SCS study for Tinley Creek (Reference 1).

9.5.1 Floodways

Floodway computations for Tinley Creek were revised as a result of the new hydraulic computations.

The revised floodway was computed on the basis of equal conveyance reduction from each side of the flood plain using the SCS computer program (Reference 4). The results of these computations are tabulated at selected cross sections for each segment for which a floodway was computed and are presented in Table 2, Floodway Data.

9.6.1 Other Studies

The studies of those communities bordering the Village of Crestwood that are affected by the Tinley Creek reanalysis include the Flood Insurance Studies for Cook County and the Village of Alsip (References 5 and 6). The Cook County Flood Insurance Study differed from this study regarding the flood delineations and zone designations for the stream reach that extends from 700 to 1,000 feet downstream of Central Avenue. Hence, flooding was delineated in this study to reflect flooding that is not shown in the currently effective Cook County Flood Insurance Study. The Flood Insurance Studies for Cook County and the Village of Alsip do not agree with the Special Flood Hazard Areas designated for Tinley Creek along the northern corporate limits from the intersection of Calumet Sag Road and 127th Street to the west corporate limits for the Village of Crestwood. Cook County and the Village of Alsip may be revised in the future to match the revised flood delineations, base flood elevations, and peak discharges presented in this study. This study supersedes the Flood Insurance Studies for Cook County and Alsip for flood delineations along Tinley Creek.

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9.7.1 References and Bibliography

1. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Illinois Department of Transportation, Division of Water Resources, Floodplain Management Study, Lower Tinley Creek, Cook County, Illinois, Champaign, Illinois, September 1984.

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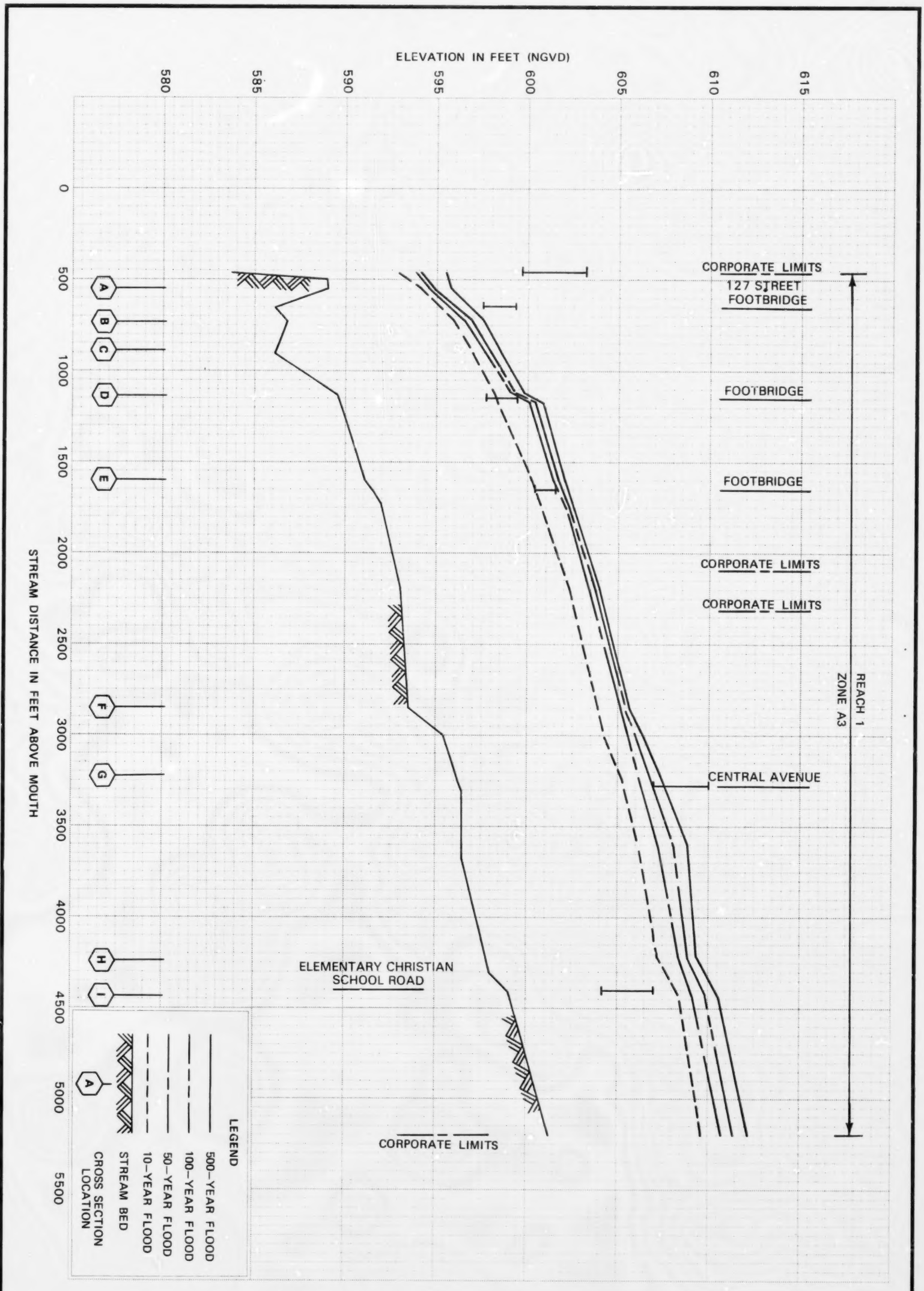

01P	FEDERAL EMERGENCY MANAGEMENT AGENCY VILLAGE OF CRESTWOOD, IL (COOK CO.)	FLOOD PROFILES TINLEY CREEK

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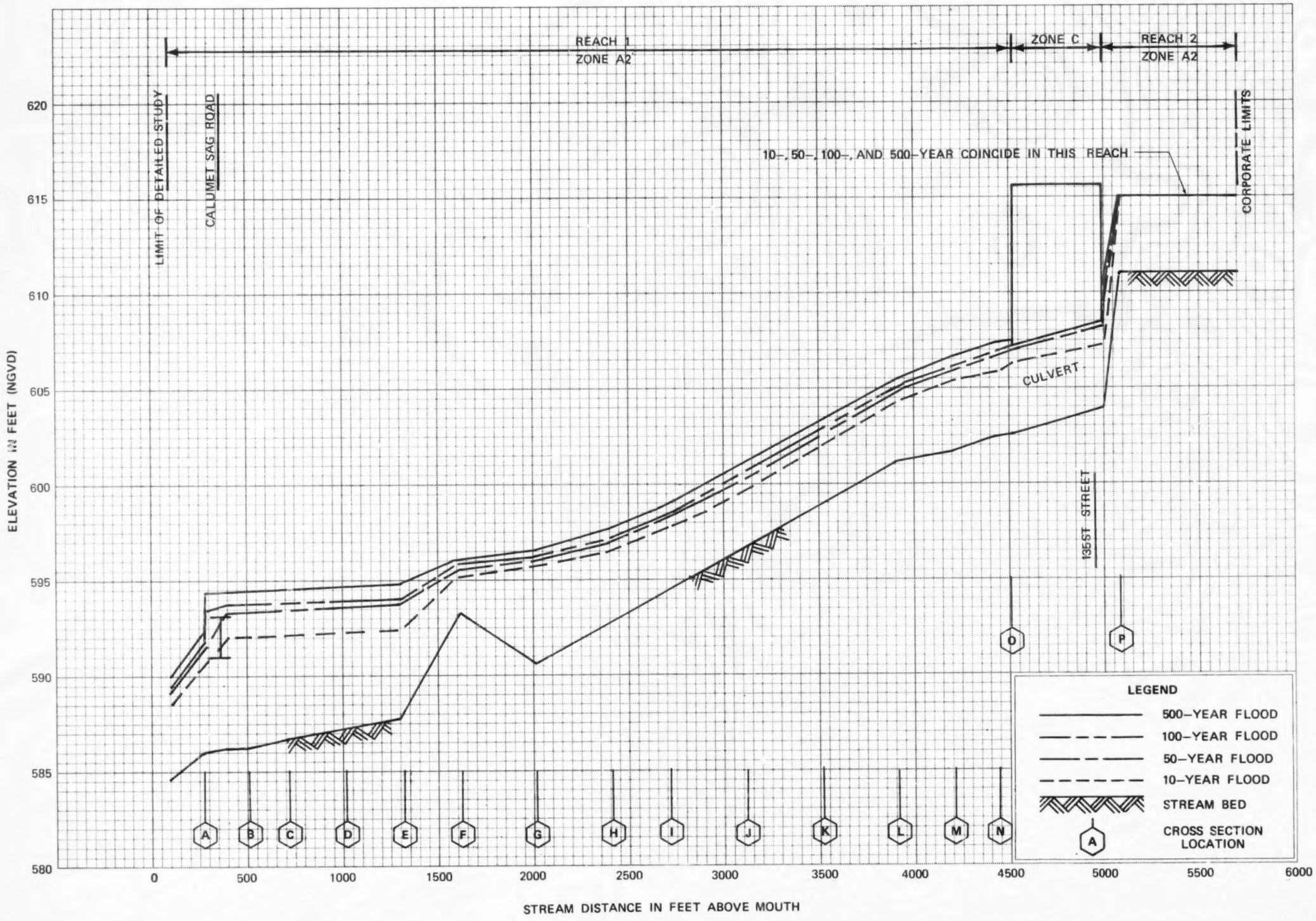

FLOOD PROFILES

CRESTWOOD DRAINAGE DITCH WEST

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF CRESTWOOD, IL
(COOK CO.)

02P

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